the human hand(s) for universal right or left-hand operation, and / or universal thumb or finger operation.

57. The method of Claim 53 wherein said step of attaching further positions a part or all of said sensor(s) on the human hand(s) in an adjustable fashion whereby the user can adjust and / or change the location(s) of a part or all of said sensor(s) to obtain customized sensor placement.
58. The method of Claim 53 wherein said step of attaching further provides a non-slip means for securing said sensor(s) onto the hand(s) whereby said sensor(s) will not twist and turn while said sensor(s) are being manipulated.
59. The method of Claim 53 wherein said step of attaching further includes a adjustable conforming means for securing said sensor(s) to a wide range of finger shapes and sizes.
60. The method of Claim 53 wherein said step of attaching further includes a relocating means for removing said sensor(s) from their operating position, and repositioning said sensor(s) for storage, whereby said sensor(s) can be removed and docked onto or into said relocating means.
61. The method of Claim 53 wherein said step of converting is physically removed from said sensor(s), this step further including a transferring of said sensor output to said step of converting, whereby said sensor attaching can be smaller in size.
62. The method of Claim 61 wherein said transferring comprises a cable structure that is routed between the base knuckles of the hand in a captive fashion, whereby the cable will not slip off the top of the hand, and additional steps of securing the cable are minimized or eliminated.
63. The method of Claim 61 wherein said step of transferring includes a cable structure that exits said sensor(s) in a manner that facilitates universal right or left hand operation, and / or universal thumb or finger operation.
64. The method of Claim 61 wherein said step of transferring includes a cable structure that is further maintained in a gently snug fashion.
65. The method of Claim 61 wherein said step of transferring includes a cable structure that can be further repositioned for convenient use, and storage."

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**REMARKS – GENERAL:**

By the above amendment, the applicants have expanded the prior art section to more fully detail existing limitations in this crowded field. Minor editorial changes have also been made to the specification, and a new drawing (Figs. 5A-5B) has been included in order to bring clarity to various statements in the original specification. The drawing figures have also been renumbered throughout the specification to comply with 37 CFR 1.121(d).

The claims have also been rewritten to define the invention more particularly and distinctly so as to overcome technical rejections and to define the invention patentably over the prior art.

**Objection TO Drawings:**

The drawing objections as defined in the office action are noted. The drawing figure numbers have been corrected in both the specification, and within each drawing sheet. Additionally a new drawing (Figs. 5A-5B) is being proposed in order to bring clarity to several comments of the original specification. A drawing approval request including all of the proposed drawings has been included with this mailing for re-submittal and approval.

**Rejection Of Claims Is Overcome:**

The last (first) office action rejected the claims. These claims were first rejected on the basis of 35 USC 102, saying that they were previously described by Zngf et al (US 2004/0012564 A1). Secondly, claims were objected to under 35 USC 103(a) as not being unobvious over Zngf et al (US 2004/0012564 A1) in combination with Eng et al (5,638,092). The applicant has therefore rewritten the claims to more distinctly convey the patentable features of the invention. The applicants request consideration of the new claims for the following reasons:

(1) The claims solve several **unrecognized problems** that the prior art suffers from.
(2) The claims define **new and unexpected results** and hence are novel and unobvious over the prior art.
(3) The claims support a significant advancement in the "**crowded art**".
(4) The claims define a **new principal of operation** for placement and operation of mouse sensors to obtain mouse-cursor movement.
(5) The claims provide **solutions to long-felt and unsolved needs.**

**The References And Differences Of The Present Invention Thereover:**

Prior to discussing the claims and the above points, the applicant will first discuss the references and the general novelty of the present invention and its unobviousness over the references.

**Zngf et al** (Pub. No.: US 2004/0012564 A1):

(1) Zngf et al requires the user to learn a whole new "hand-eye-coordination" skill set. This is an **unrecognized problem in the industry**. With Zngf it is due to the fact that cursor movement is obtained from three different sensors instead of just one. Hence, three different body elements (wrist, thumb, index-finger) are required to move the cursor instead of just one body element (see paragraph 0004). However, the applicants' invention only requires one "conventional" sensor and one body element for cursor-movement. And hence the applicants' invention does not require a new "hand-eye-

coordination" skill set. This is a **New Principal Of Operation** as conventional sensors can be used in an **unconventional** manner to obtain mouse cursor movement.

(2) Zngf et al requires **three sensors** in order to obtain mouse cursor movement (see paragraphs 0011, 0012, & 0013). However, the applicants' invention only requires **one sensor**, and therefore has the advantage of "**Omission Of Elements**". This has several benefits as follows:

a) The applicants' invention reduces the number of working components.

b) The applicant's invention reduces the overall size of the unit.

c) The applicants' invention reduces the overall cost of the unit.

d) The applicants' invention reduces the overall complexity of the unit.

(3) Zngf et al requires the manipulation of all digits of the hand (four fingers, one thumb, and the wrist) (see paragraph 0005). However, the applicants' invention only requires two hand elements. One finger or thumb for mounting the device on, and an opposing finer(s) or thumb for manipulating the sensors. Therefore the applicants' invention benefits from a **reduction of required body elements**. This is particularly **appealing to handicapped persons**.

(4) Zngf et al cannot be used when performing any other function such as typing on the keyboard. This is due to the fact that as the user types (or performs other functions), the mouse cursor will be moving across the computer screen in an uncontrolled manner. Adding simultaneous "mouse-click" activation from the middle, ring, and little finger will bring complete mayhem to the computer environment. Any movement of the wrist and or fingers will cause the user to unintentionally delete files and execute other computer commands (see paragraph 0005). Accidental sensor activation is an **Unrecognized Problem** in the art as most mouse alternatives suffer from this same shortcoming (refer to the amended specification for details). However, the applicants' invention avoids accidental sensor activation. This is a natural benefit of the applicants' invention due to the fact that the user must make a determined and conscious effort to manipulate the sensors with the opposing finger(s) and or thumb(s). This provides a **solution to a long-felt and unsolved need.** Thus, **New** and **Unexpected Results** are obtained when the sensors are mounted and used as defined by the applicants' invention.

(5) Zngf et al is not ambidextrous, and is designed for the right hand only (see paragraph 0010). This is due to the fact that when the device is moved from the right hand to the left, all of the sensors will function in the opposite direction (assuming the sensors are even functional in the opposite direction). This would be a particular problem for ambidextrous users. This problem would require expensive bi-directional sensors, and / or a separate device program for left handed users. Additionally, using the device on the left hand places the sensors on the wrong side of the glove. This may interfere with other work functions (see Figures 1 & 2). However, the applicants' invention employs several ambidextrous embodiments that have been specifically designed for universal right or left hand operation, and / or universal finger or thumb operation.

(6) Zngf et al is not complementary to handicapped persons. For example; if a user were missing their index finger, they would be unable to use Zngfs' invention. However, with the applicants' invention

the user would simply place the device (like the one shown in the first Figure.) on the middle finger. Hence, with the applicants' invention a **handicapped user** would maintain complete functionality.

(7) Zngf et al is a glove type device that cannot be quickly and conveniently attached or removed. This makes it more difficult to wash hands, shake hands, use the bathroom, or perform other hygiene functions (see Figures 1 & 2). However, the applicants' invention is not a glove type device and therefore can be quickly and conveniently attached or removed.

(8) Zngf et al would require periodic sterilizing and cleaning similar to that of an article of clothing (see paragraph 0010). This would be especially necessary in the event that multiple operators were sharing the same device. However, the applicants' invention is not a glove type device and therefore will not require the cleaning and maintenance that a clothing or glove type unit will require.

(9) Zngf et al requires the user to rotate the wrist between 0-180 degrees (see Figure 3, and paragraph 0016). . This is a physically extreme task to perform, and could eventually lead to a repetitive-stress injury. However, the applicants' invention does not unnecessarily stress the body elements. In fact, the unit is typically used with the thumb, fingers, and wrist in the "physically correct" position. This is the position similar to that when the hand is in a naturally relaxed state.

(10) Zngf et al fails to utilize wireless communications whereby the user would not be tethered to the computer (see Figures 1 & 2). However, the applicants' invention specifically encompasses both "wired" and "wireless" electrical interface embodiments whereby the user is freed from the desktop.

(11) Finally, Zngf et al fails to see commercial success as a computer mouse replacement. Therefore, this solution must have limited advantages in the marketplace. However, since the applicants' invention addresses so many of the markets' **unsolved problems**, it should be considered as having **novel** and **unobvious** content.

**Zngf et al** (Pub. No.: US 2004/0012564 A1) in combination with **Eng et al** (5,638,092):

(1) **Unsuggested Combination:** Zngf & Eng do not contain any suggestion, either expressed or implied, that the two different technologies and / or approaches should be combined in the manner suggested. It is well known that in order for any prior-art references to be validly combined for use in a prior-art USC-103 rejection, the references themselves (or some other prior art) must suggest that they be combined. e.g., as was stated in In re Sernaker, 217 U.S.P.Q. 1, 6 (C.A.F.C. 1983):

> *"[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings."*

Additionally, the suggestion to combine the references should not come from the applicants. This was forcefully stated in Orthopedic Equipment Co. vs. United States, 217 U.S.P.Q. 193, 199 (C.A.F.C. 1983):

*"It is wrong to use the patent in suit [here the patent application] as a guide through the maze of prior art references, combining the right references in the right way to achieve the result of the claims in suit [here the claims pending]. Monday morning quarterbacking is quite improper when resolving the question of nonobviousness in a court of law [here the PTO]."*

(2) **References Are Individually Complete:** Both Zngf & Eng are individually complete and functional within themselves as a whole. Therefore there would be no reason to use parts from one, or add parts to, or substitute parts to either reference.

(3) **References Take Different Approaches:** Both Zngf & Eng take mutually exclusive paths to reach a common solution. Since both references use different technologies and strategies, it would not be logical to combine them. Doing so would not provide a complimentary solution.

(4) **References Teach Away:** Zngf & Eng each use different technologies and take different strategic paths to their solutions. In doing so, each reference discourages using a dissimilar technology.

(5) **Difficult To Combine:** Because Zngf & Eng each use different technologies and strategic approaches, it would be both excessively expensive, and technically difficult to combine them. It would also be very difficult to use. In other words, combining a virtual reality glove with a relative positioning radio transmitter ring, in combination with a multi radio receiver keyboard, is not a practical combination. Additionally, this combination would require an excessive amount of components. However, the applicants' invention minimizes the amount of additional circuit components.

(6) **Inoperative Combination:** The amended specification has described how both Zngf & Eng suffer from accidental sensor activation, and other shortcomings. Combining the two approaches would magnify these failures. Therefore this combination would still not satisfy the problems in the current art. However, the applicants' invention and corresponding claims do!

(7) **Claimed Features Lacking:** Although combining Zngf with Eng would make for a curious combination, this combination would not be able to satisfy the inventors' amended claims. As such, this combination would still suffer from accidental sensor activation, and would still require the user to learn a new "hand-eye-coordination" skill set.

(8) **Lack Of Implementation:** If the combination of Zngf with Eng were obvious because of its advantages, then those skilled in the art would have implemented it by now. However this combination is not seen in the marketplace because not only is it unobvious, but is an inoperative combination as well. However, the applicants' claims do solve the unrecognized problems in this industry, and therefore will see an implementation in the marketplace.

**Other References:** There are a myriad of other references in this "crowded art" as detailed in the amended specification. However the applicants' invention has many differences and advantages over this prior art. The primary differences and advantages being that the applicants' invention:

1) Solves an **unrecognized problem in the industry** by avoiding accidental sensor activation caused by human hand movements.
2) Solves an **unrecognized problem in the industry** by avoiding accidental sensor activation caused by holding or touching things with the human hand.
3) Solves an **unrecognized problem in the industry** by not requiring new "hand-eye-coordination" skills.
4) Solves an **unrecognized problem in the industry** by not interfering with the tactile touch senses, and gripping ability of the human hand.
5) Can be completely manipulated solely within the confines of the human hand.
6) Can be **used by handicapped** persons who are missing one or more finger(s).
7) Does not interfere with computer keyboard operation, writing with a pen, or other standard office functions.
8) Does not allow the mouse-cursor to move across the computer screen in an uncontrolled manner while typing on the keyboard.
9) Does not require a tabletop or planar surface.
10) Can be fabricated using existing computer-mouse technologies and manufacturing techniques.
11) Minimizes the number of additional circuit components.
12) Does not have the "article of clothing" limitations of a glove type device.

In some way, all other prior art fall short of the above advantages. Still further differences are apparent but are too numerous to conveniently detail at this time. Please read the amended specification for details.

It should also be noted that the prior art as discussed in the amended specification have achieved little (if any) commercial success. Therefore the marketplace is seeking an invention that addresses these **unsolved problems** as identified and solved by the applicants' invention.

**The Claims Define New And Unexpected Results**
**And Hence Are Novel And Unobvious Over The Prior Art.**

The applicants submit that the novel features of the claims are unobvious and hence patentable under 35-USC-103 since they produce **new, superior, and unexpected results** over the references or any obvious combination thereof. The synergy of these results culminate in the ability of the applicants' invention to provide an easy to use computer pointing (or video game) device that avoids accidental sensor activation, can be manipulated solely within the confines of the human hand, that does not require a new hand-eye-coordination skills, and that does not interfere with the tactile and gripping ability of the user. This is an important advancement in a field of such **"crowded art"**.

CLAIM 40 recites: "*...affixing said sensor(s) to the human hand(s) ... said attaching means further positioning said sensor(s) to be manipulated by the opposing finger(s) and / or thumb of the same hand that said sensor(s) are mounted on, whereby said sensor(s) are only activated by a deliberate effort of the user, said attaching means further positioning said sensor(s) so as to avoid accidental sensor activation, whereby a user can hold a glass and perform other standard hand operations without accidentally activating a sensor(s).*" None of the references make such a suggestion, claim, or even recognize accidental sensor activation as a problem. Furthermore, the novel features in this claim provide a **disproportionate amount of synergistic results**:

a) Avoids accidental sensor activation from the body elements. In other words, the applicants' invention avoids accidental sensor activation by the users' fingers and hand. Sensors are only activated by a deliberate effort of the user. This has been an **Unrecognized Problem** in the industry that the applicants' invention solves.

b) Avoids accidental sensor activation from elements external to the body. In other words, the applicants' invention avoids accidental sensor activation when performing standard operations such as typing on the keyboard, holding a glass, answering a phone, etcetera. This has been an **Unrecognized Problem** in the industry that the applicants' invention solves.

c) Liberation from desktop. Since the apparatus is manipulated and controlled solely within the confines of the human hand, the user now has total freedom to remove the hand (and body) from the desktop environment without loosing functionality. Wireless embodiments of the electrical interface will be particularly liberating.

d) Maintain keyboard registration. Now that the sensors reside on the human hand, and are manipulated solely within the confines of the human hand; the user now has no reason to remove the hand from the keyboard area. Thus the tedious back-and-forth motion between the keyboard and desktop mouse is eliminated.

e) Retain use of hand(s) for other tasks. Since the apparatus is attached to the human hand, and since the sensors will not be accidentally activated; the user then retains the usefulness of the hand to perform other duties such as holding a glass, answering a phone, writing with a pen, etcetera. This has been an **Unrecognized Problem** in the industry that the applicants' invention solves.

f) Retains use of existing hand-eye-coordination skills. Since the invention can use the same types of sensors already in use by tabletop devices, the same hand-eye-coordination skill set will be used. Therefore the user is not required to learn a new skill-set. This has been an **Unrecognized Problem** in the industry that the applicants' invention solves.

g) **New principal of operation.** Again, the same types of sensors that are used in conventional tabletop mice and laptops can be used in the new invention. However, they are used in a new and unconventional way that reaps many subtle and synergistic results as detailed above.

**Therefore, this claim brings about a long sought after and COMPREHENSIVE solution that remedies the many problems in the marketplace.**

Dependent Claims 41-52 incorporate all of the subject matter of Claim 40, and add additional subject matter which makes them novel and unobvious by default, and independently patentable over the references.

CLAIM 41 recites: "*...said attaching means is further ergonomically shaped to expose the finger and / or thumb pads so as to preserve the tactile and griping qualities of the human hand.*" Many inventions have buttons and other sensors on the finger pads. This is an obvious problem when typing on the keyboard, or holding an object. Other inventions do leave most of the fingers exposed. However, this is not done on purpose, but rather in ignorance of the true issues involved. In these cases the fingers and / or finger pads are left exposed by happenstance, and / or convenience. However, the applicants' invention recognizes the true importance of having the finger pads exposed. That is to retain the tactile senses and gripping surfaces of the finger pads. Of particular importance is being able to feel the registration "bumps" on the "F", "J", and "5" keys of a computer keyboard (as explained in the specification). Retaining the tactile senses for keyboard use has been an **Unrecognized Problem** in the industry. None of the references make any suggestion or claim to recognizing or solving this problem.

CLAIM 42 recites: "*...means to facilitate universal right or left hand operation and / or universal finger or thumb operation..*" Here too is an **Unrecognized Problem** in the industry. For a device to have commercial success, it must be able to satisfy the personal traits of the end user. Hence the device must satisfy both right and left-handed users, and users that prefer attaching the device to the thumb instead of the finger, etcetera. This is discussed in multiple locations of the specification. None of the references adequately address this problem.

CLAIM 43 recites: "*...positions a part or all of said sensor(s) in a relocatable fashion whereby a part or all of said sensor(s) can be repositioned on said attachment means for universal right or left-hand operation....*" Here is a different solution to the above **Unrecognized Problem** in the industry. This is also addressed in several places of the specification. None of the references adequately address this problem, or consider solving the problem in this manner.

CLAIM 44 recites: "*...in an adjustable fashion whereby the user can adjust and / or change the location(s) of a part or all of said sensor(s) to obtain customized sensor placement...*" Another **Unrecognized Problem** in the industry is the ability to configure a hand-mounted device for customized sensor placement. Again, this is addressed in multiple areas of the specification. None of the references recognize or address this problem.

CLAIM 45 recites: "*...further includes a non-slip interior surface for securing said attachment means onto the hand whereby said attachment means will not twist and turn....*" Another **Unrecognized Problem** in the industry is the necessity to keep the hand-mounted unit from moving about while it is being manipulated. Again, this is addressed in multiple areas of the specification. None of the references recognize or address this problem.

CLAIM 46 recites: "*...includes a adjustable conforming means for securing said attachment means to a wide range of finger shapes and sizes....*" The glove type devices in the prior art do discuss using an elastic material for their glove. However the applicants' invention takes a different implementation that requires a different set of solutions. This claim addresses the requirements of the applicants' approach. The prior art does not discuss having device that conforms to a persons finger size and shape. The applicants' claim addresses this problem.

CLAIM 47 recites: "*.....electronics interface is in a separate enclosure from said attachment means,....,*
*....whereby said attachment means for mounting said sensor(s) can be smaller in size.*" The benefits of this claim allow for a smaller more convenient sensor assembly. This will allow the devices to be designed for a much wider range of applications. Again, the prior art does not recognize this issue.

CLAIM 48 recites: ".....a cable structure that is routed between the base knuckles of the hand in a captive fashion...." This is well discussed in the specification, and facilitates a **reduction of elements**. This is due to the fact that less cable restraints (if any) will now be required.

CLAIM 49 recites: "*.....cable structure that exits said attachment means in a manner that facilitates universal right or left hand operation, and / or universal thumb or finger operation.*" Here too the invention is designed to address as many user preferences as possible. Again, this issue is not adequately addressed by the prior art. However, the problem is identified in the applicants' specification, and is addressed in this claim.

CLAIM 50 recites: "*.....a cable structure that is retractable to and extendable from said electronics interface enclosure....*" This is also well discussed in the specification. This not only brings about a **reduction of elements** by minimizing or eliminating cable restraints, but is also an item of convenience. Here too, cable management is not discussed or addressed by the prior art.

CLAIM 51 recites: "*.....further includes a relocating means for repositioning said attachment means, whereby said attachment means can be removed and docked onto or into said relocating means.*" Storage of the device is another **Unrecognized Problem** in the industry. The applicants' invention allows one to

conveniently store the item onto or into the electronics enclosure. Other prior art references fail to address the issue of storage.

CLAIM 52 recites: "*.....a cable retraction and extension means, wherein said transferring means is a cable structure that is retractable to and extendable from said relocating means, whereby said cable is maintained in a gently snug fashion when said sensor(s) is deployed, and the cable is neatly withdrawn when said attachment means is retracted.*" This is self-explanatory and is in support of the above claim. Here too another **Unrecognized Problem** in the industry is the storage and management of the cable. Other prior art references fail to address this issue.

CLAIMS 53 through 64 recite method claims that are supported by the above arguments.

Accordingly, the applicants submit that the claims are of a novel content and that they provide new and unexpected results. . Primarily, the **synergy** and **interconnection** of the above claims culminate in a **superior device** for entering commands to a computer, video game, or other machine. A device that is **comprehensive, user friendly, and easy to manufacture**.

**The Claims Support A Significant Advancement In The "Crowded Art":**
The mature field of computer input devices is in desperate need of a device that is comprehensive but yet user friendly. Additionally, the device must be cost-effective and easy to manufacture. In spite of the crowded art, the applicants' invention solves the industry's problems by using a novel approach that produces **unexpected and synergistic results**.

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**CONCLUSION:**

For all of the above reasons, the applicants submit that the specification and claims are now in proper form, and that the claims all define patentably over the prior art. Also, because the art is so "**crowded**", the applicants see this invention as making a significant step in the field. Primarily, the **synergy** and **interconnection** of the above claims culminate in a **superior device** for computers and video games. The invention of which is inherently easy to use, and solves the **unrecognized problem** of accidental sensor activation. Therefore the applicants submit that the application is now in condition for allowance, which action the applicants respectfully solicit.

**Conditional Request For Constructive Assistance:**
The applicants have amended the specification and claims of this application so that they are proper, definite, and define novel structure which is also unobvious. If for any reason this application is not

believed to be in full condition for allowance, the applicants respectfully request the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P 706.03(d) and 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible.

Very Respectfully,

21 April 05 4/21/05 4/21/05

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2005 April 21, _____

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